



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,357	10/28/2003	Jay T. Young	X-1434 US	6712
24309	7590	09/21/2005	EXAMINER	
XILINX, INC ATTN: LEGAL DEPARTMENT 2100 LOGIC DR SAN JOSE, CA 95124			LIN, SUN J	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,357

Applicant(s)

YOUNG ET AL.

Examiner

Sun J. Lin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-20 and 22-33 is/are rejected.
- 7) ☒ Claim(s) 6 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/28/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. This office action is in response to application 10/696,357 filed on 10/28/2003. Claims 1 – 33 remain pending in the application.

Claim Objections

2. Claims listed below are objected to because of the following informalities:
Claim 1, line 17, change "routing resources" to **—target routing resource—**.
Claim 2, line 1, before "identifying" insert **—the—**.
Claim 3, line 2, change "targeted" to **—target—**.
Claim 3, line 2, before "marking" insert **—the—**.
Claim 3, line 3, change "routing resources" to **—target routing resource—**.
Claim 3, line 3, change "each net" to **—the net—**.
Claim 3, line 4, change "the routing resources" to **—each of the target routing resources—**.
Claim 3, line 5, change "targeted" to **—target—**.
Claim 4, line 3, change "targeted" to **—target—**.
Claim 5, line 1, change "wherein" to **—wherein,—**.
Claim 5, line 2, before "routing resource" insert **—target—**.
Claim 5, line 7, change "the identified" to **—an identified—**.
Claim 6, line 2, before "routing" insert **—the target—**.
Claim 9, line 2, change "code" to **—codes—**.
Claim 9, line 21, change "routing resources" to **—target routing resource—**.
Claim 12, line 22, change "routing resources" to **—target routing resource—**.
Claim 13, line, change "claim 9" to **—claim 12—**.
Claim 14, line, change "claim 9" to **—claim 12—**.
Claim 15, line 19, change "routing resources" to **—target routing resource—**.
Claim 16, line 1, before "routing" insert **—the—**.
Claim 17, line 1, before "routing" insert **—the—**.
Claim 18, line 1, before "identifying" insert **—the—**.
Claim 19, line 2, change "targeted" to **—target—**.
Claim 19, line 2, before "marking" insert **—the—**.
Claim 19, line 3, change "routing resources" to **—target routing resource—**.

Art Unit: 2825

Claim 19, line 3, change "each net" to **—the net—**.

Claim 19, line 4, change "the routing resources" to **—each of the target routing resources—**.

Claim 19, line 5, change "targeted" to **—target—**.

Claim 20, line 3, change "targeted" to **—target—**.

Claim 24, line 2, change "code" to **—codes—**.

Claim 24, line 21, change "routing resources" to **—target routing resource—**.

Claim 29, line 23, change "routing resources" to **—target routing resource—**.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- (1). Determining the scope and contents of the prior art.
- (2). Ascertaining the differences between the prior art and the claims at issue.
- (3). Resolving the level of ordinary skill in the pertinent art.
- (4). Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1 – 5, 7 – 20 and 22 – 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Admitted Prior Art, AAPA (Paragraph [0002] – [0011]; Fig. 1; Fig. 2) in view of U.S. Patent No. 6,130,550 to Kolze et al.

5. As to Claim 1, AAPA show and disclose the following subject matter:

- A method for generating a test design for a programmable logic device – [Paragraph 0002 – 0011; Fig. 1; Fig. 2];

- Testing routing resources (i.e., interconnecting lines, PIPs, routing multiplexers etc.) – [paragraph 0007];
- Known routing software (i.e., router) is designed to rout (each of known) nets between its net terminals, typical from a known source terminal (i.e., router source target) to a known load terminal (i.e., router load target) – [paragraph 0007]; router has been used to test routing resources – [Paragraph 0010]; Notice that (1) a known net is a net, that has known functional characteristics at its source and load terminals, and the net is identified suitable for use in testing a (target) routing resources (2) a target routing resource under investigation should be connected to the source terminal and load terminal of the identified net (3) the source terminal of the identified net is a router starting point; whereas the load terminal of the identified net is a router load target (4) to check route connectivity, router should route backwards from the target routing resource to the known source terminal (or from the known source terminal route forwards to the target routing resource), and route forwards from the target routing resource to the known load terminal (or from the known load terminal to route backwards to the target routing resource);
- Testing failure of a routing resource under test is reported (i.e., marked) – [0009]; information regarding a routing resource that has already been (completely) test is recorded (i.e., marked) and stored in a database – [Paragraph 0010]; It is an industrial QA/QC practice that an item (e.g., target routing resource) went through a testing process, whether passed or failed, it should be marked “tested”.

AAPA does teach loading (i.e., programming) an unrouted design and identifying nets in the unrouted design in designing the test design. But Kolze et al. teach using a test circuit (i.e., test device) for testing the integrity of routing structures in a programmable integrated circuit – [title]. Kolze et al. teach loading a plurality of routing resources in an unrouted design that includes a plurality of un-programmed antifuses disposed between routing wire segments for use in selection on of the routing resource structures for testing – [abstract].

Notice that the antifuses disposed in the test design are programmable, they are implemented in order to accurately guide a router through desired routing wire

Art Unit: 2825

segments, to isolate target routing resources and to select a target routing resource for testing.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have applied the teachings of Kolze et al. in disposing programmable antifuses in the test design in order to accurately guide a router through desired routing wire segments., to isolate target routing resources and to select a target routing resource for testing.

Notice that a remainder of the unrouted design can be routed by programming antifuses in order to create a complete test design.

For reference purposes, the explanations given above in response to Claim 1 are called **[Response A]** hereinafter.

6. As to Claims 9, 12, 15, 24 and 29, reasons are included in **[Response A]** given above.

7. As to Claim 2, in a programmable logic device (PLD), the target routing resources will be reprogrammed to realize many ASIC designs that apply different I/O terminals on the PLD, therefore, all nets in the unrouted design that can be used to test the target routing resources should be identified.

For reference purposes, the explanations given above in response to Claim 2 are called **[Response B]** hereinafter.

8. As to Claim 3, reasons are included in **[Response A]** given above. Notice that a plurality of target routing resources is a set of target routing resources.

For reference purposes, the explanations given above in response to Claim 3 are called **[Response BB]** hereinafter.

9. As to Claim 4, due to reprogrammable nature of antifuses in the unrouted design, the loading (programming), identifying, processing and routing can be repeated is some of the target routing resources were not successfully processed .

For reference purposes, the explanations given above in response to Claim 4 are called **[Response C]** hereinafter.

10. As to Claim 5, reasons are included in **[Response A]**, **[Response B]** and **[Response C]** given above.

11. As to Claim 7, if one router is utilized, the routing backwards, identifying, and routing forwards are performed sequentially.

For reference purposes, the explanations given above in response to Claim 7 are called **[Response D]** hereinafter.

12. As to Claim 8, in order to select an suitable net and to achieve good connection between source terminal, target routing resource under study and load terminal, at least two of the routing backwards, identifying, and routing forwards are performed interactively one with another.

For reference purposes, the explanations given above in response to Claim 8 are called **[Response E]** hereinafter.

13. As to Claims 10, 13, 22, 27 and 32 reasons are included in **[Response D]** given above.

14. As to Claims 11, 14, 23, 28 and 33 reasons are included in **[Response E]** given above.

15. As to Claims 16 and 17, reasons are included in **[Response A]** given above.

16. As to Claim 18, reasons are included in **[Response B]** given above.

17. As to Claim 19, reasons are included in **[Response BB]** given above.

18. As to Claim 20, reasons are included in **[Response C]** given above.

Art Unit: 2825

19. As to Claims 25, 26, 30 and 31, reasons are included in [Response A] given above.

Allowable Subject Matter

20. Claims 6 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Those claims are allowed is because that the prior art does not teach or fairly suggest the following subject matter:

- A method of generating a test design for a programmable logic device, the method comprising marking the target routing resources that are not yet tested to receive a router expansion bonus in combination with other limitations as recited in **Claim 6**;
- A method of generating a test design for a programmable logic device, the method comprising marking the target routing resources that are not yet tested to receive a router expansion bonus in combination with other limitations as recited in **Claim 21**.

Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sun J Lin whose telephone number is (571) 272 - 1899. The examiner can normally be reached on Monday-Friday 9:30AM - 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on (571) 272 - 1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2825

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sun James Lin
Patent Examiner
Art Unit 2825
September 19, 2005

A handwritten signature in black ink, appearing to read 'Sun James Lin', is written over the typed name.